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A comparison of Navy and private hospitals' capital budgeting justifications

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A COMPARISON OF NAVY AND PRIVATE HOSPITALS' CAPITAL BUDGETING JUSTIFICATIONS

by

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June, 1995

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This study provides an in-depth analysis of the capital budgeting justifications currently being used in Navy hospitals and the civilian health care industry. In a hospital setting where the primary objective is often stated to be that of providing quality health care services and saving lives, the tendency is to evaluate capital budgeting justifications in terms of its ability to help reach that primary objective, and not to evaluate it in strictly financial terms. However, in an environment of increasing competition and regulation, hospitals are now entering a period wherein complacency in capital budgeting has given way to anxiety, and astute management of the budgetary process is emerging as one of the acid tests of financial fitness. Most of the information necessary for effective strategic planning is external in nature. Upper management must monitor and assess such things as health care industry growth rates, regulatory environment, financing trends, compensation policy and others. Capital equipment items obtained through proper justification, will establish an equipment infrastructure that will assist the organization in providing optimal health care services.

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A COMPARISON OF NAVY AND PRIVATE HOSPITALS' CAPITAL BUDGETING JUSTIFICATIONS

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ABSTRACT

This study provides an in-depth analysis of the capital budgeting justifications currently being used in Navy hospitals and the civilian health care industry. In a hospital setting where the primary objective is often stated to be that of providing quality health care services and saving lives, the tendency is to evaluate capital budgeting justifications in terms of its ability to help reach that primary objective, and not to evaluate it in strictly financial terms. However, in an environment of increasing competition and regulation, hospitals are now entering a period wherein complacency in capital budgeting has given way to anxiety, and astute management of the budgetary process is emerging as one of the acid tests of financial fitness. Most of the information necessary for effective strategic planning is external in nature. Upper management must monitor and assess such things as health care industry growth rates, regulatory environment, financing trends, compensation policy and others. Capital equipment items obtained through proper justification, will establish an equipment infrastructure that will assist the organization in providing optimal health care services.

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ACRONYMS

BUMED, Bureau of Medicine

CFO, Chief Financial Officer

CHAMPUS, Civilian Health and Medical Program of the Uniformed Services

CONUS, Continental United States

DHC, DoD Health Council

HCA, Health Care Activity

HSR, Health Service Region

MEDIVAC, Medical Evacuation

MTF, Military Treatment Facility

O&MN, Operations and Maintenance Navy

OP, Other Procurement

PBD, Program Budget Decision

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I. INTRODUCTION

A. BACKGROUND

This study will provide an in-depth analysis of the capital budgeting justifications currently being used in Navy hospitals and the civilian health care industry. Capital equipment item justifications are used by hospitals when purchasing: auto analyzers, electrophoresis scanners, ultra sound imagers, electron microscopes, CAT scans, electromagnetic resonance (EMR) scanners, radiology treatment equipment, etc.... These capital equipment items are vital to the medical practice, but are used by only a relatively small percentage of the population. In the current environment of shrinking budgets, the justifications for capital equipment items have come under closer review.

B. OBJECTIVES

In an environment of increased competition for budget dollars, the health care industry is entering a period where proper allocation of reduced capital is critical to its economic soundness. Capital budgeting justification can be motivated by several different factors.

The type of revenue system that a hospital is under can affect its capital budgeting justifications. A hospital can

be thought of basically as a hotel. In an indemnity, or non-capitation, system a hospital earns revenue by filling its rooms. But in the new managed care environment, all the rules of the game are changing. Under a capitation system, hospitals get paid per member per month whether the outpatients need the facility or not. Hospitals get paid the same amount whether a heart attack patient stays three days or twenty days. Turnaround time (TAT) becomes very important. Therefore, one justification for new equipment is how much it will decrease turnaround time.

Cost effectiveness has been a traditional justification. Will it be more efficient to purchase an auto analyzer that preforms a large metabolic panel of tests, or to continue to operate an auto analyzer that would do a more limited panel? Efficiency being measured as the ability to produce more output with the same, or fewer inputs.

Private hospitals operate in a competitive environment. To remain economically sound, hospitals need to attract doctors with paying clientele. Doctors with paying clientele will be attracted to institutions with current, state-of-the-art capital equipment items. To attract these doctors, hospitals need to maintain current, state-of-the-

art capital equipment items. Justification to purchase capital equipment items to attract doctors then becomes a valid priority.

The health care industry is unique in that efficiency and economic soundness cannot be the only justification for the purchase of capital equipment items. Effective health care must also be considered. The capital equipment items may be efficient and economical, but they are not effective if they don't prolong or save lives.

Hospitals risk loss of Medicare certification, or closure, if regulatory and accreditation replacement of capital equipment items are not implemented in a timely fashion. Therefore, the threat of loss of accreditation, Medicare certification, or the license to operate for failure to purchase and install capital equipment items required by government regulators and accrediting agents remains an extremely important justification.

Health care industry capital budgeting justifications are varied and unique. Therefore, health care institutions cannot focus on just one justification for purchasing capital equipment items. Capital budgeting must set priorities, on all justifications, by taking into account both economic and effectiveness issues.

C. RESEARCH QUESTIONS

The primary research question is: What is the current capital budgeting process being used by Navy hospitals?

Supporting questions include:

What capital budgeting justifications are being used by Navy hospitals, private hospitals and Kaiser's health maintenance organization?

As Navy hospitals transition to a capitated financing system, has there been an underlying migration in the types of capital budgeting justifications used?

D. SCOPE, LIMITATIONS, AND ASSUMPTIONS

The focus of this thesis is to first analyze Navy hospitals' current capital budgeting processes with emphasis on process flow that generates the capital budgeting justifications.

Additionally, the focus of this thesis will be to discover and describe alternative justifications, for the utilization of capital dollars that are to be allocated for purchases of capital equipment items.

Finally, as Navy hospitals transition to a capitated financing system, focus will be placed on possible underlying migrations in the types of capital budgeting

justifications used.

It is beyond the scope of this thesis to recommend specific capital budgeting "models" for the purchase of health care industry, capital equipment items.

It is also, beyond the scope of this thesis to attempt to divided capital equipment items as 'plant/fixed' or 'equipment/moveable.'

Additionally, it is beyond the scope of this thesis, to analyze the effectiveness of capital budgeting justifications that have been used in the past.

E. LITERATURE REVIEW AND METHODOLOGY

1. Framing the Problem

To answer the research questions, data on the current capital budgeting in Navy hospitals and civilian health care industries will be reviewed. Additionally, a comprehensive list of current capital budgeting justifications being used in Navy hospitals and the civilian health care industry will be constructed. Finally data will be gathered as to the previous use of capital budgeting justifications in Navy hospitals. This data will be used to establish a baseline to determine if there has been any underlying migration in the types of capital budgeting justifications used, as the

Navy transitions to a capitated finance system.

2. Data Collection

Methodology is the particular set of strategies, domains and techniques employed in generating or testing a theory, or answering a research question (Buckley, Buckley and Chiang, 1976). In this thesis, the views, judgments and appraisals of other people will be sought to answer the research questions. To address the research questions the "opinion" strategy will be used. The domain is "individual." The informal technique of "interviews" will be used to gather data from several experts in the field of hospital capital budgeting. Data from these interviews will be used to determine how the capital budgeting process is being conducted in both Navy hospitals and civilian health care industries. Additionally, interviews will help construct a comprehensive list of capital budgeting justifications currently being used by Navy hospitals and health care industries.

Data on previously used capital budgeting justifications in Navy hospitals will be obtained from the Navy Medical Logistics Command. The justifications will be used to construct a baseline of current capital budgeting practices.

Bibliography searches for articles, papers and other sources will also be obtained by using the archival method.

3. Analysis of Data

An in-depth analysis of the interviews and literature will be conducted to gain an understanding of the capital budgeting process currently being used by Navy hospitals and civilian health care industries. Analysis will be descriptive in nature, focusing on the process flow that generates justifications.

Analysis will also generate a descriptive, comprehensive list of capital budgeting justifications that are currently being used by Navy hospitals and civilian health care industries. The capital budgeting justification will be presented in tabular form.

Finally, an analysis will be conducted of previous capital budgeting justifications that have been used by Navy hospitals in the acquisition of capital equipment items. Emphasis of analysis will be placed on trends of data as Navy hospitals transition to capitated finance system.

F. DEFINITIONS AND ABBREVIATIONS

Capital Equipment Items, fixed assets used in the health care industry.

Capital Budget, is an outline of planned expenditures on fixed assets.

Capital Budgeting, is the whole process of analyzing projects and deciding which ones to include in the capital budget.

Capital Budgeting Justification, that part of capital budgeting leading up to capital budget decision making. The justification will sway decision makers to accept, or reject the acquisition of capital equipment items.

Indemnity, something (as a sum of money paid in compensation) that indemnifies.

Capitation, a counting or assessing of individuals by head. A tax fixed at an equal sum per person.

Electron Microscope, any of a class of microscopes that use electrons rather than visible light to produce magnified images, especially of objects having dimensions smaller than the wavelengths of visible light.

Justification, the act of justifying. The condition or fact of being justified. The fact, circumstance, or evidence that justifies; grounds of defense.

Reagent, any substance used in a chemical reaction to detect, measure, examine, or produce other substances.

Spectrophotometer, an instrument used to determine the distribution of energy in a spectrum of luminous radiation.

G. ORGANIZATION OF STUDY

Comparison of Navy hospital and civilian health care industry capital budgeting justifications will provide a background to understand how different capital budgeting justifications are motivated.

The current health care environment is changing daily. Chapter II will describe the Navy's current capital budgeting process. Chapter III will provide a comprehensive list of capital budgeting justifications. This list will be obtained from interviews and literature reviews as discussed above. Finally, in Chapter IV an analysis will be conducted of the previous justifications used by the Navy. Such analysis will provide decision makers a criteria to gain information from people who have experience in the area of current capital budgeting justifications. Justifications properly implemented, could lead to reduction in duplication of capital equipment items, and cost containment in health care institutions.

II. NAVY HEALTH CARE CAPITAL BUDGETING ENVIRONMENT

This chapter will discuss the Navy's health care capital budgeting environment. First, a discussion of the current DoD health care environment will be provided. Next, a discussion of the current thresholds for DoD hospital capital equipment items will be given. Finally, a presentation of the current DoD routing for a hospital capital equipment item justification will be given.

A. CURRENT MILITARY HEALTH CARE ENVIRONMENT

1. Military Treatment Facilities

The DoD medical establishment is sized against the wartime requirement. Because it is sized against this requirement, it tends to provide more capacity in peacetime than is needed to meet the health care demands of the active duty force. This extra peacetime capacity is used to fulfill a second mission of the DoD medical establishment. This second mission is to provide care to other categories of beneficiaries--family members of active-duty personnel, and military retirees and their family members and survivors (PA&E, 1994).

Approximately 8.7 million people were eligible for DoD health benefits during fiscal year 1993. As shown in Figure 1, active-duty personnel (1.9 million) and their family members (2.7 million), including the active reserves, accounted for 53 percent of the DoD beneficiary population. The remaining 47 percent (or 4.1 million beneficiaries) was made up of retired military personnel and their family members and survivors (733, 1994).

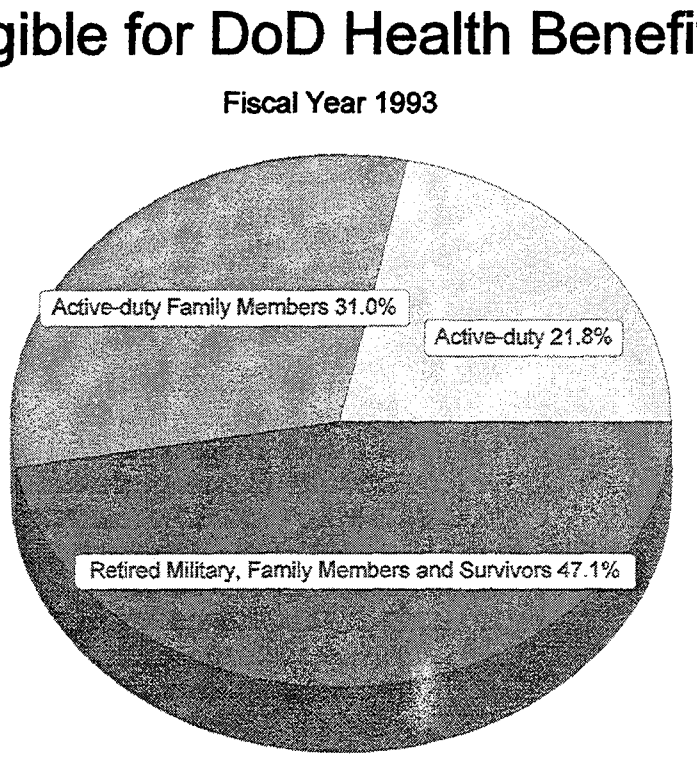

Figure 1. Eligible for DoD Health Benefits (733, 1994).

Health care services for DoD beneficiaries are provided by Military Treatment Facilities (MTFs). These MTFs are operated by the three military departments (Army, Navy and Air Force). There are three main categories of MTFs: clinics, community hospitals, and medical centers. The range of services provided by the MTFs varies considerably. Clinics, for example primarily provide only the simpler medical services referred to as "primary care." DoD community hospitals offer both primary and secondary care and a few also provide some tertiary services. "Secondary care" covers the broad range of medical services between primary care and the complicated medical or surgical procedures--some forms of chemotherapy and open heart surgery, for example--categorized as tertiary care. Military medical centers are generally large, "tertiary care" facilities capable of handling very complex cases as well as providing primary and secondary care (PA&E, 1994).

First priority in MTFs is given to active-duty personnel. Active duty personnel are required to use military facilities for their medical care. All other DoD beneficiaries are provided treatment in MTFs only on a space available basis. Prior to 1966, if MTFs could not provide the treatment these beneficiaries required, they had to

arrange and pay for their own medical care. That changed with the inauguration of the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) in 1966. In broad terms CHAMPUS provides supplemental health care coverage, available automatically to qualified DoD beneficiaries (733, 1994).

2. Wartime Requirements vs. Peacetime Medical Care

Section 733 of the 1992 authorization act directed DoD to examine the current size of the military medical system in light of the projected requirements of the U.S. forces for medical care in a conflict. The central conclusion of this portion of the study is that wartime requirements for medical care have declined significantly from the levels that prevailed in the Cold War era.

The study concluded that to treat casualties evacuated to the United States as a result of two nearly-simultaneous major regional conflicts, the United States would require approximately 9,000 hospital beds in the Continental United States (CONUS) military medical facilities. The analysis conducted for this study indicates that medical demands in CONUS could be met by about one-third of the 30,000-bed capacity of the MTFs planned to be operating in FY 1999 (733, 1994).

The central question considered in the analysis was: should DoD reduce its medical establishment to support the much smaller wartime mission now envisioned, or should it maintain some of the excess capacity in order to provide peacetime care to non-active-duty beneficiaries? (733, 1994).

The study incorporated costs such as depreciation and costs for indigent care which are not experienced by MTFs. These costs were included in an effort to create an "apples to apples" comparison between the price of care provide through MTFs and that provided through CHAMPUS. The study concluded that MTFs can provide care less expensively on a case-by-case basis than can CHAMPUS. For a given workload, a price advantage of 10 to 24 percent for MTFs relative to CHAMPUS was recognized (733, 1994).

Several reasons were given for the MTFs cost advantage. First, MTFs provide care in what are usually more austere settings than are found in civilian facilities--fewer private rooms, simpler amenities, and so on. Second, with notable exceptions, the military system is under less pressure to adopt unproven technologies, thereby slowing the pace to technology-induced cost growth.

Although, the study found that the Defense Department could provide care more cost-effectively in MTFs than CHAMPUS, the cost advantage is offset by a second factor. The study found that for every ten patients pulled into MTFs from CHAMPUS, the MTFs would also see about six patients who otherwise would have sought treatment through third party insurance or would have deferred care. While it might be less expensive to treat in MTFs, for every ten cases that come from CHAMPUS, DoD would be treating a total of 16 new cases in military facilities, while saving the CHAMPUS costs of only ten (733, 1994).

This analysis of the problem strongly indicates that within the current rules on eligibility and cost-sharing maintaining capacity greater than that required for wartime is more costly than downsizing to a capacity sufficient to meet wartime demands (733, 1994).

3. Controlling DoD Health Care Costs

The DoD medical establishment is under going health care reform. In 1993 DoD established 12 Health Service Regions (HSRs) within the United States. As shown in Table 1, each HSR is headed by a medical center commander designated as a Lead Agent (Lamar, 1994).

The Lead Agent is a critical component of the DoD health care program. Lead Agents -- working cooperatively with all the Services' regional MTF commanders and their staffs -- will be directly responsible for the development, implementation, and management of the regional health plan for their beneficiaries, including the development of an integrated health care network within their Health Service Region (Lamar, 1994).

HSR	Lead Agent	Population	USA	USN	USAF	TOTALS
Region 1	National Capital	1,093,918	5	6	4	15
Region 2	Portsmouth (USN)	872,011	3	3	2	8
Region 3	Eisenhower (USA)	1,063,770	4	4	5	13
Region 4	Keesler (USAF)	595,024	3	2	5	10
Region 5	Wright-Patterson (USAF)	653,328	2	1	3	6
Region 6	Wilford Hall (USAF)	949,778	4	1	9	14
Region 7	William Beaumont (USA)	396,332	2	0	6	8
Region 8	Fitzsimons (USA)	732,821	5	0	9	14
Region 9	San Diego (USN)	710,461	1	3	3	7
Region 10	David Grant (USAF)	382,590	1	2	4	7
Region 11	Madigan (USA)	350,439	1	2	1	4
Region 12	Tripler (USA)	151,750	1	0	0	1
TOTALS:		7,952,222	31	23	54	107

Table 1. Lead Agents (Lamar, 1994).

It is important to note that the MTFs within each HSR retain their Service-designated chain-of-command --

irrespective of their Lead Agent's Service affiliation. Each Service will retain existing authority to make decisions regarding direct care (MTF) operating funds, facility maintenance and personnel actions (Lamar, 1994).

In addition DoD transitioned to a capitation based method for allocating health care funds to the military departments at the beginning of FY 95. Capitation budgeting is a recognized strategy for health care cost containment. Under this concept, each MTF commander is responsible for providing health care services to a defined population for an average fixed amount per beneficiary. This capitation methodology minimizes inappropriate increases in health care services and reduces the unnecessary provision of more costly care that is not clinically appropriate, since there are no associated financial incentives for workload inflation. Additionally capitation discourages inappropriate hospital admissions, excessive lengths of stay, and unnecessary care (Lamar, 1994).

B. THRESHOLDS ON CAPITAL EQUIPMENT ITEMS

DoD hospital capital equipment item costs are normally budgeted from either an expense appropriation, Operations and Maintenance (O&MN), or an investment appropriation,

Other Procurement (OP). Program Budget Decision (PBD) No. 706, dated 16 December 1994, changed the Expense/Investment criteria to permit all non-centrally managed equipment to be funded by the Operations and Maintenance appropriations rather than the Procurement appropriations.

The new policy, set forth in PBD No. 706, is intended to provide installation and local Commanders with greater flexibility to make decisions concerning the purchase of equipment that will improve efficiency or the quality of life. The new policy will eliminate the need for local managers to obtain Procurement funds which are generally managed at the headquarters level. This will allow more opportunities to invest in equipment that will result in cost savings. The budgeting impact of this PBD is a transfer of funds from Procurement to O&M. The PBD affected all service and Defense-wide Procurement accounts.

As of the writing of this thesis though, all capital equipment items that have a unit cost equal to or greater than $50 thousand are still budgeted in the Procurement appropriations. Items less than $50 thousand are also budgeted in the Procurement appropriations if they are centrally managed.

C. DoD CAPITAL EQUIPMENT ITEM JUSTIFICATION FLOW

The current routing instructions for a capital equipment item justification are governed by a Tri-service instruction. The Army is responsible for maintaining the instruction. The instruction is currently under revision, the last update was November of 1986.

The regulation applies to all Health Care Activities (HCA). An HCA is defined as a fixed health care facility of the Army, Navy, or Air Force Medical Department. The HCAs are responsible for several activities when budgeting for high cost capital equipment items. First, the HCAs are responsible for maintaining appropriate equipment programs to identify equipment requirements meeting the dollar thresholds. Second, they are responsible for submitting capital equipment item requests.

Requests for capital equipment items are reviewed by the regional Lead Agent and by the local Veterans Administration (VA) hospital when that facility is located within 40 miles of the requesting health care activity.

The Lead Agent is responsible for reviewing equipment requests from the HCAs within the region and coordinating requests with other regions when appropriate. The Lead Agent will provide concurrence (or nonconcurrence) based on

the total need for the requested item within the region and return all requests to the submitting HCA.

After Lead Agent review, the HCA will send the request through appropriate departmental intermediate level reviewer within its service channels. The departmental intermediate level reviewer is defined as any Departmental intermediate command or Service activity that reviews health care activity medical requests below departmental level. In the case of the Navy the intermediate level reviewer would be the Naval Logistics Medical Command located at Fort Detrick, Maryland. The departmental intermediate level reviewers are responsible for the following activities:

(1) Determining if the requested item is required to provide the level of care assigned to the requesting HCA.

(2) Determining if manpower levels and levels of care will remain at a level that will sustain the need for the requested item.

(3) Determining if operation and maintenance funds are available to make facility changes, install and inspect equipment, and purchase needed supplies.

(4) Determining if a less expensive alternative exists.

(5) Ensuring that cost and workload data are logically developed and accurately presented.

Finally, the departmental intermediate level reviewers will send approved requests to the departmental medical logistics division.

The departmental medical logistics division is the functional activity of The Surgeon General of each department that review requests from their department and those of the other services. In the case of the Navy the departmental medical logistics division is the Assistant Chief for Logistics at the Bureau of Medicine (BUMED-04). The departmental medical logistics division performs an administrative review of each equipment request to be sure it complies with the appropriate instructions. Next, they perform a technical review of each request to be sure it is a complete system that will do the jobs required by the HCA. They are also responsible for the following distribution:

(1) Send requirements to appropriate departmental consultants for review and concurrence or nonconcurrence.

(2) Send requirements to their counterparts in the other two services for concurrence.

(3) Send a copy of each request to the Deputy Assistant Secretary of Defense (Medical Readiness).

(4) Furnish a copy to the Executive Director, DoD Health Council (DHC).

Additionally, they review and analyze requirements received from the other Services and recommend that the designated member of the Military Medical Regions Task Group approve or disapprove the request.

The Military Medical Regions Task Group is composed of a general or flag officer of directorate level from each of the military medical departments and a representative of the OASD(HA). The departmental member will evaluate the Tri-service implications of the request, resolve any points not resolved at a lower level, and send approved requests, with formalized recommendations to the DHC.

The DoD Health Council (DHC) is a Secretary of Defense level organization that coordinates, standardizes, and oversees military health service programs. The DoD Health Council will, evaluate each item requirement, resolve any points not previously resolved, and approve or disapprove the request.

Figure 2 is a line diagram of the routing through which a capital equipment item justification must travel for approval.

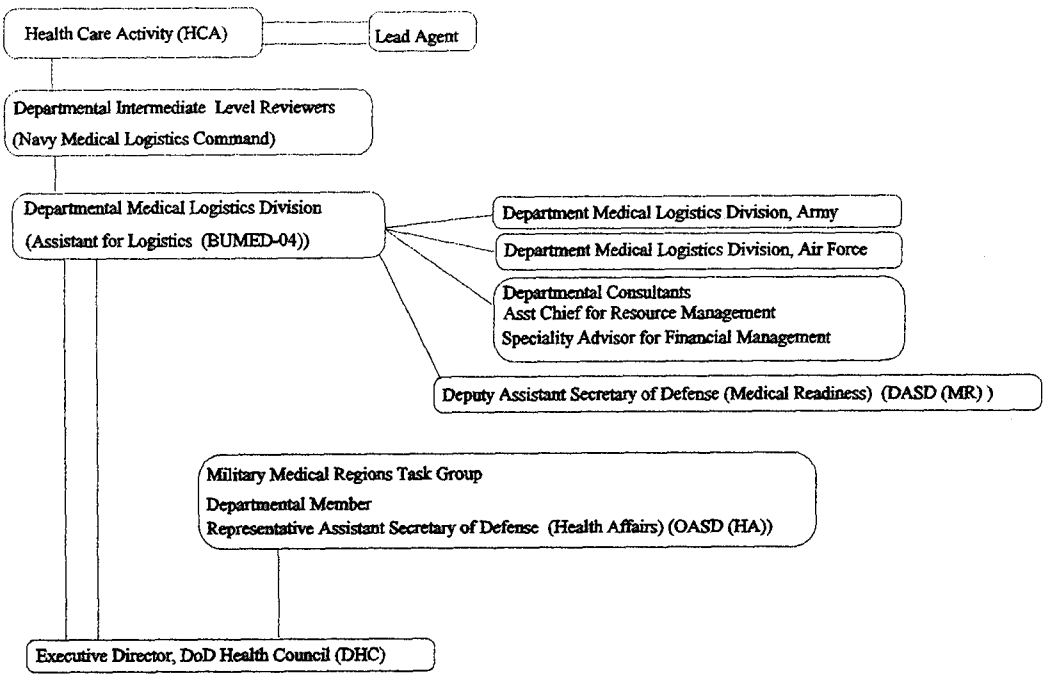

Figure 2. Capital Budgeting Justification Routing.

III. CAPITAL BUDGETING JUSTIFICATIONS

This chapter will discuss why capital budgeting justifications are becoming more important in the procurement of capital budgeting items. Next, it will discuss some of the complexities that are unique to hospital capital budgeting. Finally, a comprehensive list of capital budgeting justifications will be presented.

A. INCREASING IMPORTANCE OF CAPITAL BUDGETING IN HOSPITALS

In the 1980's, the hospital industry underwent some of the most dramatic and unprecedented changes in its operating environment. In a period that could now be considered the "good old days" by many hospital administrators, the cost of treating patients could, for the most part, be passed on to patients or their insurers (Kamath and Elmer, 1989). For the most part the capital investment decisions were made on an "as needed" basis (Cleverley and Felkner, 1982). Hospitals often based their capital investment decisions on criteria such as the "community need" or the "hospital need" (Kamath and Oberst, 1992). This often led to inappropriate spending decisions and generally insulated hospital management from having to consider risk when making capital budgeting decisions (Tarimcilar and Khaksari, 1991). These

munificent environmental conditions lulled health care mangers into a state of complacent dependency, and many regarded capital budgeting as tedious and inscrutable activity best delegated to accountants (Myer, 1985).

In years past, capital funds from federal and philanthropic sources were plentiful, and reimbursement policies virtually guaranteed that hospitals would recover whatever capital costs they incurred (Myer, 1985). Governmental agencies as well as private insurers took steps to control the payments to the health care providers in an effort to contain the mushrooming costs of health care (Kamath and Oberst, 1992). The hospital industry nationwide found itself in the midst of dramatic upheaval. The economic and the demographic forces created such a competitive environment that hospital administrators had to learn the meaning of "survival of the fittest" the hard way, probably in the same fashion the nation's airlines, banks and even the universities are currently learning (Kamath and Elmer, 1989).

In an environment of increasing competition and regulation, hospitals are now entering a period wherein proper allocation of limited capital is critical to their survival (Tarimcilar and Khaksari, 1991). Complacency in

capital budgeting has given way to anxiety, and astute management of the budgetary process is emerging as one of the acid tests of financial fitness (Myer, 1985).

B. HOSPITAL CAPITAL BUDGETING COMPLEXITIES

Capital budgeting decisions in the health care industry are far more complex than those in a typical proprietary firm. The primary objective of a health care institution is often stated as providing quality health services and saving lives (Tarimcilar and Khaksari, 1991).

In a hospital setting where the primary objective is often stated to be that of providing quality health care services and saving lives, the tendency is to evaluate capital budgeting justifications in terms of its ability to help reach that primary objective, and not to evaluate it in strictly financial terms (Kamath and Elmer, 1989).

Some other reasons for additional complications include the "duality of command and tradition," inexact performance requirements, confusion over who the "true" owners of the hospitals are and debate over who should benefit from capital investments (Kamath and Elmer, 1989). In addition, the health care facility needs to gain acceptance from the health care professionals, as well as from the community it

serves. The capital budgeting justifications required to increase and/or maintain this acceptance are very difficult to evaluate because of the difficulty in quantifying all the expected benefits (Kamath and Elmer, 1989).

However, the only way a hospital ultimately can accomplish its mission of providing quality health care services to a community is by being financially healthy. Health care institutions cannot afford to concentrate on only a single objective while ignoring any others. They must therefore evaluate capital projects from all 'angles' by taking into account economic, social, and political issues simultaneously (Tarimcilar and Khaksari, 1991).

C. CAPITAL BUDGETING JUSTIFICATIONS

Financial managers of hospitals often must justify the costs of capital equipment items to top hospital executives because of up-front system expenses. All too often, traditional cost justifications are limited in scope, failing to address the need for new systems (Rawitz, Cowan, and Paige, 1990). Armed with a comprehensive list of justifications with detailed information from all areas--needs, products benefits, benefit values, and return on investment, vendor offerings, and new system benefits--

managers will be able to successfully justify the costs of new systems.

The following is a comprehensive list of capital budgeting justifications currently being used by Navy hospitals and health care industries.

1. Avoidance of Operating Costs

Operating costs are those expenses which are directly associated with the project's operation, such as wages and salaries, maintenance and any increase in overhead expenses brought about by the adoption of the project (Wacht, 1970).

In the new managed care environment hospitals are not necessarily trying to generate new business, but trying to service the business at hand at the lowest possible operating costs. In the new environment it is hard to convince hospital administration that increased volume justifies more equipment. Justifying equipment on the basis of reduced operating costs becomes important. As discussed by a physician from the California Pacific Medical Center:

> Since increased volume has become a less effective justification, what you need to do is have ways to keep track of the work that is done, the number of procedures that are done, and then find some methodology for trying to determine what is the avoidance of operating costs by purchasing a piece of equipment.

a. Maintenance Costs

If maintenance records are kept, you can make some judgements about the capital equipment items, just as you would with a car. As it becomes more expensive to repair the car, than it does to turn that money into the purchase of a new one, its time to make a change. Avoiding maintenance costs then becomes a justification for purchasing new capital equipment items.

b. Salary Costs

The second thing is keeping track of advantages of replacing the equipment with something that will go faster and avoid salary costs associated with technicians and technologists if possible. For example, the purchase of an automatic cover slipper, can eliminate an hour, maybe an hour and twenty minutes a day of technologists time, in manually gluing on cover slips to microscope slides. Avoiding the cost of salaried personnel conducting routine operations then becomes a justification for purchasing a capital equipment item to automate the process.

In some situations the purchase of a capital equipment item could automate the interpretation of data, or eliminate calibration. This would allow the hospital to substitute someone who doesn't have a

technologist/specialist license and therefore does not get paid at the same level. Avoiding the costs of a technologist/specialist by substituting technicians then becomes an even stronger justification.

c. Costs of Laboratory Space

Some pieces of capital equipment items demand space. Laboratory space is very expensive to construct and maintain. Other pieces of equipment have other specialized needs. Some instruments don't work well if the temperature is not controlled because of the sensitivity of their electronic circuit boards.

Therefore, purchasing capital equipment items that take up fewer valuable square feet to avoid the costs of constructing new, or maintaining current laboratories becomes a justification.

d. Operating Material Costs

Another area to look at is purchasing equipment which uses a smaller amount operating materials (paper, reagents, plastics, etc.), or uses materials that are less expensive to dispose of. For instance, if the hospital could replace an instrument that replaces radiomino acid with bioluminescence for conducting laboratory tests it doesn't have to worry about a license for dealing with

radioactive material, or the disposal of radioactive material.

Avoiding operating material costs by purchasing capital equipment items that use less operating material, or operating material that is less expensive to dispose of then becomes a justification.

2. Turnaround Time (TAT)

In the new managed care environment which is now affecting hospitals, all the rules of the game are changing. Hospitals try to stay empty because they are writing capitation contracts. Hospitals get paid per member, per month whether the outpatients need the facility or not. The hospital is paid on a capitation basis. It gets paid so much per patient. Whether a heart attack patient stays three days or twenty days, it gets paid the same amount. Time becomes very important. As described by a physician of a Kaiser hospital in California:

> If for example, a giant laboratory in Florida would do all our tests for free, with a three or four day turnaround time, we could not afford to send it to them, because the turnaround time would consume more in additional hospitalization than would be saved in laboratory costs. Time is important. Time gets patients out of the hospital. Turnaround time (TAT) is the operative word. We need decrease in turnaround time. We need to get results out faster.

Therefore, one justification for capital equipment items is decreased turnaround time.

3. Employee Work Environment

Hospital Chief Financial Officers (CFOs), in a recent survey concerning budgeting expenditures, labeled "employee morale" as one of the least important qualitative factors affecting capital equipment justifications (Kamath and Elmer, 1989). Although by itself, employee work environment/morale is listed as a low priority, it could be used to strengthen a primary justification. The automatic cover slipper discussed previously has a secondary benefit in that the instrument can be put in a fume hood and hospital employees do not have to sniff the xylene or solvent that is used as a mounting medium. The automatic cover slipper is both an advantage in terms of replacing an hour and twenty minutes of a technologist's time, but can also avoid employee contact to polar solvent.

Improving employee work environment, then becomes an additional justification for the purchase of capital equipment items.

4. Physician Request

In a recent survey concerning hospital capital budgeting expenditures, CFOs reported that their hospitals

were highly influenced by physician requests in the decision to replace capital equipment items (Campbell, 1994). In an another study capital budgeting survey respondents found "physician demand" to be one of the top three most important qualitative factors considered in the capital budgeting process (Kamath and Oberst, 1992).

Physician demand then, is an important justification for capital equipment items.

5. Regulatory and Accreditation Requirements

Previous research into hospital capital investment behavior established that CFOs consider meeting regulatory or accreditation requirements the most important factor affecting capital equipment item replacement (Campbell, 1994). This high priority status perhaps reflects the fact that hospitals risk loss of Medicare certification, or closure, if regulatory and accreditation replacements are not implemented in a timely fashion (Campbell, 1994).

Thus, the threat of loss of accreditation, Medicare certification, or the license to operate for failure to purchase and install capital equipment items required by government regulators and accrediting agents remains an extremely important justification.

6. Patient Concerns

Research conducted in 1994 into hospital capital investment behavior established that CFOs regarded 'patient complaints' as a low priority factor affecting capital equipment item replacement (Campbell, 1994). The low priority is consistent with the view that hospitals' primary customers are physicians and not patients (Pauly and Redisch, 1973).

Patient complaints/concerns can be used as justification to purchase capital equipment items, but will probably receive low priority in the capital budgeting process.

7. Reputation/Attracting Physicians

Many hospitals acquire new capital equipment items to retain or build a reputation for clinical and technological excellence. New technology may be an asset in attracting the most competent physicians as well as those patients seeking these types of physicians for their care. Additionally, new technology is necessary to retain and expand physician referral base in a competitive mode by virtue of sustaining a reputation as a comprehensive, state-of-the-art hospital (Schawarts, 1990). New technology is vital to any hospital to attract physicians and patients (Cerne, 1991).

Buying capital equipment items to attract physicians by maintaining a reputation as a state-of-the-art hospital then becomes a justification.

8. Service Expansion to Capture Revenue

Under an indemnity or self pay system, one major justification for hospitals is to 'capture revenue' by looking for new business to provide a service. Increased revenue alone would be enough to justify a capital equipment item. Now, as hospitals move into more of a capitation environment the hospital is much more interested that it doesn't generate new opportunities for people to buy more tests or services, unless it could really be justified. As discussed by a physician from the California Pacific Medical Center:

> One method that is rare now is generating new business. The hospital is somewhat risk adverse. We'd have to really prove that we really could generate new business and that the competition wasn't so great that it would not be an effective purchase. So, when we talk about generating revenue it is largely from the stand point of selling the service to either outpatient user or the other hospitals that would use us as a reference.

So, as the percentage of capitation reimbursements increases 'expansion to capture revenue' as a justification for capital equipment items will become less effective.

9. 'Earmarked' Donations

Often hospitals will receive donations or gifts to purchase specific capital equipment items. If donations are not earmarked, the monies will go through the capital budgeting rationing process.

If capital equipment items are 'earmarked' by philanthropic source the justification is straightforward.

This chapter provided a discussion on the increasing importance of the capital budgeting process as reimbursements are shifting in percentage from indemnity or self pay, to capitation. Additionally, a discussion of the complexities of hospital capital budgeting process was provided. Finally, a list of capital budgeting justifications was provided. This list provides a snapshot of what is and is not working as capital budgeting justifications, as hospitals transition into the capitation environment.

IV. DATA ANALYSIS

Chapter IV provides an analysis of capital equipment item justifications used by Navy Hospitals in Fiscal Year 1994 and the first four months of Fiscal Year 1995.

A. JUSTIFICATIONS FISCAL YEAR 1994

In FY 1994, 639 Command Equipment Requests were approved. These requests were routed through the Naval Medical Logistics Command. A sampling technique was used to reduce the number from 639 to 71 with substantial assurance of little or no expected error. A description of the formula used to derive the sample size is provided in the Appendix.

The capital equipment item justification sections of the Command Equipment Request are shown in Table 2.

Each justification section of the Command Equipment Request will be addressed separately. Many of the sections interact.

1. Section Two: Item Description

This section provides a short narrative description of the capital equipment item to be purchased. Additionally, this section classifies the equipment as a "new" or

2. Item Description/NSN
a. Equipment is new_____/replacement_____item.

3. Suggested Manufacture _____ Model Number _____ Total Acquisition Cost $_____

4. DETAILED JUSTIFICATION

a. The requested item function is currently accomplished by:

b. Average annual cost of performing the procedure from local civilian\VA\DOD sources: $_____

c. Estimated annual cost of performing the procedure with the requested equipment: $_____

d. Will procurement lead to CHAMPUS recoupment? Yes/No
Estimated CHAMPUS savings: _____

e. Will equipment increase command productivity? Yes/No
If so, how? _____ (no dollar amount)

f. Will equipment affect related services?
(i.e., increased manhours/supplies etc.) Yes/No
Estimated cost: $_____

g. Is this item for clinical investigations? Yes/No

h. Other:

6. REPLACEMENT INFORMATION
Item being replaced
Plant account number
Manufacturer
Proposed Disposition:
____ Retain _____ Redistribute ____ Dispose

7. EQUIPMENT MAINTENANCE AND REPAIR (to be filled out by BMET)
Item to be replaced:
Age ___ Condition Code ___ Life Expectancy ____
Total Manhours Expended: Preventive Maintenance _____
Corrective Maintenance _____
Cost of repair parts and service to date $_____
Cost of maintenance services to date $_____

Maintenance and Repair will be provided by:
___ In-house biomedical repair staff
___ Additional tools/test equipment required Cost: $_____
___ Commercial Contract Est. Cost $_____

8. FACILITY/EQUIPMENT REQUIREMENTS
a. Should this be a Turnkey installation acquisition? _____
b. Facility modification requirements:
c. Total Cost: $_____

Table 2. Justification Sections of Command Equip. Request.

"replacement" item. Replacement items will replace, like or similar, items that the hospital already owns. A new item is a piece of equipment that the hospital does not currently own.

Of the 71 capital equipment item justifications analyzed for FY 94, 28 or 39%, were classified as new. The remaining 43, or 61%, were classified as replacement items.

For example, of the 28 classified as new, two capital equipment items were being purchased to eliminate the need to MEDIVAC personnel from remote sites.

2. Section Three: Total Acquisition Costs

The average cost for the 71 capital equipment items was $116,176.

3. Section Four: Detailed Justification

Section four asked the requester for seven (a. through g.) different pieces of information. Each of these areas will be discussed separately.

a. Section Four (alpha)

Section four part alpha asked, "The requested item function is currently accomplished by?" Section four part alpha is unique from the other parts in that three blank lines are provided after the question. More information was

offered in this block other than a description of what is currently performing the requested item's function.

For example, in 17 of 43, or 39%, of the justifications, existing equipment was further described as "old" or "near/exceeding expected life expectancy."

b. Section Four (bravo)

Section four part bravo asked for, "Average annual cost of performing the procedure from local civilian/VA/DOD sources." In 41 of the 71 justifications the average annual cost of performing the procedure from local civilian/VA/DOD sources was applicable and could be determined.

c. Section Four (charlie)

Section four part charlie is similar to section four part bravo. Section four part charlie asked for "Estimated average annual cost of performing the procedure with the requested equipment." In 71 of the 71 justifications the estimated average annual cost of performing the procedure with the requested equipment was applicable and could be determined.

In 41 of 71 justifications a cost comparison between part bravo and part charlie could be made. In 38 justifications a cost savings would be realized if the equipment item was purchased. The average annual savings

was $182,508. In 3 of the 41 justifications it was cheaper not to buy the equipment when only considering cost.

d. Section Four (delta)

Section four part delta asked, "Will procurement lead to CHAMPUS recoupment? And if so, what is the estimated annual CHAMPUS savings?" Only in 6 of the 71 justifications, or 8%, did the purchase lead to CHAMPUS recoupment.

e. Section Four (echo)

Section four part echo asked, "Will equipment increase command productivity? And if so, how?" Again, similar to section four part alpha, section four part echo provides one blank line for narrative comment.

In 25 of the 71, or 35%, of the justifications it was determined that acquisition of the capital equipment item would not lead to increased command productivity.

In 46 of the 71, or 65%, of the justifications it was determined that the acquisition of the capital equipment item would lead to increased command productivity. Various narrative answers were given for increased command productivity. In 5 of the 46, or 11%, of the justifications, avoidance of increasing downtime was mentioned as a reason for increased command productivity.

In 1 of the 46 justifications, reduction of technician time spent at the capital equipment item was listed as a reason for increased command productivity. In 8 of the 46 justifications, or 17%, decreased turnaround time of test results was mentioned as a cause for increased command productivity.

f. Section Four (foxtrot)

Section four part foxtrot asked, "Will equipment affect related services? (i.e., increased manhours/supplies/etc.) And if so what is the estimated cost?" Only 8 of the 71 justifications, or 11%, listed the proposed capital equipment item as affecting related services. 6 of the 8 justifications listing the proposed capital equipment as affecting services, attempted to quantify the affect.

g. Section Four (golf)

Section four part golf asked "Is this item is to be used for clinical investigations?" In 2 of the 71 justifications, the proposed capital equipment item was identified as being used in clinical investigations.

4. Section Six: Replacement Information

Section six describes the proposed disposition of existing equipment. As mentioned in section two, 28 of the 71 justifications were classified as new. Because there was no existing equipment, no information was provided in section six for 27 of the 28 justifications for new equipment. In the remaining justification the new capital equipment item was bought in addition to other existing equipment, due to required increased capabilities provided by the new equipment. In this justification the existing equipment was to be retained.

Of the 43 capital equipment items classified as replacement equipment, the disposition of existing equipment was reported as follows: 5 were to be retained as backups, 14 were to be redistributed to other facilities, and 24 were to be disposed of.

5. Section Seven: Equipment Maintenance and Repair

Section seven describes the maintenance and repair costs of the existing equipment and the proposed equipment.

Again, in 27 of the 28 new justifications no information was given as to the age of existing equipment or the cost to maintain it.

Eight of the 44 remaining justifications listed no information for current age of the equipment. Of the

remaining 36 justifications 15 listed the age of existing equipment as at, or exceeding, current life expectancy, and 5 were listed as one year before life expectancy.

In 27 of the 44 justifications cost to date for maintenance and repair for existing equipment was provided. In 4 of the justifications the maintenance was being provided by a commercial contract.

In all 71 justifications the estimated cost for proposed equipment was provided. 48 of the 71 justifications for proposed equipment noted that the maintenance was to be done by commercial contract. The maintenance for the remaining 23 was to be done by in-house bio medical staff.

6. Section Eight: Facility/Equipment Requirements

Section eight asked, "Should this be a Turnkey installation acquisition?" In a Turnkey installation the vendor is responsible for the complete installation of the equipment. Section eight additionally asked for "Facility modification requirement," and if modifications were required what was the "Total Cost."

In 24 of the 71 justifications the installations were listed as being turnkey installations, and 29 were listed as

not being turnkey installations. The remaining 18 were listed as not applicable or left blank.

In 16 of 71 justifications facility modifications were to be done. The average cost of facility modifications was $10,650.

B. JUSTIFICATIONS FISCAL YEAR 1995

Through 30 January 1995, 310 Command Equipment Requests were approved. These requests were routed through Naval Medical Logistics Command. A sampling technique was used to reduce the number from 310 to 35 with moderate assurance of little or no expected error. A description of the formula used to derive the sample size is provided in the Appendix.

1. Section Two: Item Description

This section provides a short narrative description of the capital equipment item to be purchased. Additionally, this section classifies the equipment as a "new" or "replacement" item. Replacement items will replace, like or similar, items that the hospital already owns. A new item is a piece of equipment that the hospital does not currently own.

Of the 35 capital equipment item justifications analyzed for the beginning of FY 95, 9 or 26%, were

classified as new. The remaining 26, or 74%, were classified as replacement items.

Of the nine classified as new, two capital equipment items were being purchased to eliminate the need to MEDIVAC personnel from remote sites.

2. Section Three: Total Acquisition Costs

The average cost for the 35 capital equipment items was $164,406.

3. Section Four: Detailed Justification

Section four asked the requester for seven (a. through g.) different pieces of information. Each of these areas will be discussed separately.

a. Section Four (alpha)

Section four part alpha asked, "The requested item function is currently accomplished by?" Part alpha is unique from the other parts in that three blank lines are provided after the question. More information was offered in this block other than a description of what is currently performing the requested item's function.

For example, in 11 of 26, or 42%, of the justifications, existing equipment was further described as "old" or "near/exceeding expected life expectancy."

b. Section Four (bravo)

Section four part bravo asked for, "Average annual cost of performing the procedure from local civilian/VA/DOD sources." In 18 of the 35 justifications the average annual cost of performing the procedure from local civilian/VA/DOD sources was applicable and could be determined.

c. Section Four (charlie)

Section four part charlie is similar to section four part bravo. Section four part charlie asked for "Estimated average annual cost of performing the procedure with the requested equipment." In 32 of the 35 justifications the estimated average annual cost of performing the procedure with the requested equipment was applicable and could be determined.

In 16 of 35 justifications a cost comparison between part bravo and part charlie could be made. In 14 justifications a cost savings would be realized if the equipment item was purchased. The average annual savings was $231,232. In 2 of the 16 justifications it was cheaper not to buy the equipment when only considering cost.

d. Section Four (delta)

Section four part delta asked, "Will procurement lead to CHAMPUS recoupment? And if so, what is the estimated annual CHAMPUS savings?" Only in 3 of the 35 justifications, or 8%, did the purchase lead to CHAMPUS recoupment.

e. Section Four (echo)

Section four part echo asked, "Will equipment increase command productivity? And if so, how?" Again, similar to section four part alpha, section four part echo provides one blank line for narrative comment.

In 15 of the 35, or 43%, of the justifications it was determined that acquisition of the capital equipment item would not lead to increased command productivity.

In 20 of the 35, or 57%, of the justifications it was determined that the acquisition of the capital equipment item would lead to increased command productivity. Various narrative answers were given for increased command productivity. In 3 of the 20, or 15%, of the justifications, avoidance of increasing downtime was mentioned as a reason for increased command productivity. In 1 of the 20 justifications, reduction of technician time spent at the capital equipment item was listed as a reason for increased command productivity. In two of the 20

justifications, or 10%, decreased turnaround time of test results was mentioned as a cause for increased command productivity.

f. Section Four (foxtrot)

Section four part foxtrot asked, "Will equipment affect related services? (i.e., increased manhours/supplies/etc.) And if so what is the estimated cost?" Only 5 of the 35 justifications, or 14%, listed the proposed capital equipment item as affecting related services. 3 of the 5 justifications listing the proposed capital equipment as affecting services, attempted to quantify the affect.

g. Section Four (golf)

Section four part golf asked "Is this item is to be used for clinical investigations?" In 3 of the 35 justifications, the proposed capital equipment item was identified as being used in clinical investigations.

4. Section Six: Replacement Information

Section six describes the proposed disposition of existing equipment. As mentioned in section two, 9 of the 35 justifications were classified as new. Because there was no existing equipment, no information was provided in

section six for 8 of the 9 justifications for new equipment. In the remaining justification the new capital equipment item was bought in addition to other existing equipment, due to a backlog. In this justification the existing equipment was to be retained.

Of the 26 capital equipment items classified as replacement equipment, the disposition of existing equipment was reported as follows: 3 were to be retained as backups, 8 were to be redistributed to other facilities, and 15 were to be disposed of.

5. Section Seven: Equipment Maintenance and Repair

Section seven describes the maintenance and repair costs of the existing equipment and the proposed equipment.

Again, in 8 of the 9 new justifications no information was given as to the age of existing equipment or the cost maintain it.

2 of the 27 remaining justifications listed no information for current age of the equipment. Of the remaining 25 justifications 10 listed the age of existing equipment as at, or exceeding, current life expectancy, and 6 were listed as one year before life expectancy.

In 19 of the 27 justifications cost to date for maintenance and repair for existing equipment was provided.

In 2 of the justifications the maintenance was being provided by a commercial contract.

In all 35 justifications the estimated cost for proposed equipment was provided. 21 of the 35 justifications for proposed equipment noted that the maintenance was to be done by commercial contract. The maintenance for the remaining 9 was to be done by in-house bio medical staff.

6. Section Eight: Facility/Equipment Requirements

Section eight asked, "Should this be a Turnkey installation acquisition?" In a Turnkey installation the vendor is responsible for the complete installation of the equipment. Section eight additionally asked for "Facility modification requirement," and if modifications were required what was the "Total Cost."

In 20 of the 35 justifications the installations were listed as being turnkey installations, and 11 were listed as not being turnkey installations. The remaining 4 were listed as not applicable or left blank.

In 10 of 35 justifications facility modifications were to be done. The average cost of facility modifications was $6,451.

V. CONCLUSION

A. SUMMARY

Chapter II describes the current Navy health care capital budgeting environment. Chapter III provided a comprehensive list of current capital budgeting justifications used by health care industries. Chapter IV presented a comparison of capital budgeting justifications used before and after the Navy transitioned to a capitated financing system. Chapter V will draw the report together and present conclusions and recommendations.

B. RESEARCH QUESTIONS

Data to answer the research questions are developed throughout Chapters II, III, and IV. The following are brief answers to each research question using concise interpretations of the analysis sections.

1. Primary Question

The primary research question asks: What is the current capital budgeting process being used by Navy hospitals?

Chapter II described a health care environment of reduced budgets and cost cutting measures, to include managed care and capitated financing.

Additionally, because of the general downsizing of the military, the current health care infrastructure will downsize, possibly redistribute assets, but not expand at previous growth rates. This is not necessarily a negative trend as evidenced in the analysis conducted in Chapter IV. In '94, 28% of the proposed capital equipment items required facility modifications prior to installation. The average modification cost was $6,451. In '95, 22% of the proposed equipment items required facility modifications prior to installation. The average modification cost was $10,650.

This suggests that modifications are required in approximately 25% of capital equipment item purchases, and the modifications are minor in nature. Further suggesting that current facilities and laboratories are large enough to handle new equipment with very little updating/upgrading.

2. Supporting Question #1

The first supporting research question asks: What capital budgeting justifications are being used by Navy hospitals, private hospitals and Kaiser's health maintenance organization?

Chapters III and IV describe capital budgeting justifications used in private hospitals and Navy hospitals respectively.

One of the findings in Chapter III described the "avoidance of maintenance costs" as a significant justification in private hospital capital equipment item budgeting. This is consistent with analysis conducted in Chapter IV, where the Navy hospital capital equipment item budgeting system also placed emphasis on "maintenance costs." In the Navy's justification form, long term, detailed records were kept of equipment maintenance for existing equipment. This is very important when computing how much a piece of equipment is costing in addition to its acquisition. If these records are not kept, no maintenance cost comparisons can be made. If cost comparisons cannot be made then it is difficult to tell which capital equipment items will avoided maintenance costs.

The capital equipment item maintenance records kept by the Navy also revealed another interesting point. Of existing equipment where "maintenance to date" information was provided, 7% for '94, and 9% for '95, recorded maintenance as being provided by commercial contract.

However, for the proposed capital equipment items for '94 and '95, 60% and 67% respectively, were to have maintenance provided by commercial contract.

This increase in "outsourcing" of equipment maintenance by using commercial contracts could be attributed to the fact that equipment is becoming increasingly technical, and it is easier to have sophisticated maintenance provided by an outside source. Additionally, set maintenance fees make it easier to compute "cradle to grave" costs for capital equipment items.

Chapter III also described the avoidance of "operating material costs" and "salary costs" as important justifications in the private hospital capital budgeting. In Chapter IV the Navy's justification form addressed "services" (manhours/supplies/etc.), but very little information was assigned to this area. This was evidenced by the analysis in Chapter IV, where only 14% of the justifications in '94, and 11% in '95, listed a change in services. This implies that in 86% of the proposed capital equipment items for '94, and 89% of the proposed capital equipment items for '95, will use the same amount of manpower and supplies, as equipment that is 7 to 10 years older. It is important to place emphasis on keeping records in this area, much like records are kept in maintenance. Historical record keeping of services is the only way to determine if services have increased or decreased. This

will allow the requester to document how much services can be reduced, or better yet which service costs can be eliminated completely.

Chapter III listed "Regulatory and Accreditation Requirements" as the "primary" justification in private hospital capital equipment item budgeting. This is quite different from the Navy's justification form which did not mention accreditation as a justification. Also noticeably absent from the current justification format is the lack of any emphasis placed on whether or not the capital equipment item will help in providing quality health services, or save lives.

3. Supporting Question #2

The second supporting research question asks: As Navy hospitals transition to a capitated financing system, has there been an underlying migration in the types of capital budgeting justifications used?

Chapter II described the capital budgeting process a bottom up process. Where the identification of what equipment is needed is made at the lowest levels in the organization. General management theory would agree that this is a positive component in any decision making process. However, in an environment of considerable change it is

important that upper management provide forward thinking strategic inputs to guide decision making at the lower levels. If strategic guidance is not provided during periods of change it could lead to undesirable results as analysis in Chapter IV suggests.

A comparison of the capital equipment justifications used during the '94 and '95 periods yielded very similar results. This suggests that very little in the capital budgeting process has changed as the Navy health care system switched to a capitated finance system on 01 October 1995.

When considering equipment classified as replacement, on the Navy's justification forms, 39% of the justifications in '94 and 42% of the justifications in '95, gave narrative answers that described equipment currently accomplishing the procedure as "at/near or exceeding life expectancy." This is unique because section four, part alpha, does not ask for this volunteered descriptive information.

This information is consistent with section seven of the Navy's justification form. In section seven, 25 justifications for '94, and 36 justifications for '95, provided information on the life expectancy of existing equipment. Of those justifications, 64% for '94, and 55%

for '95, recorded the equipment's life expectancy as at, exceeding, or one year prior to life expectancy.

This suggests that the current capital budgeting process is efficient in obtaining the maximum amount of utility from existing equipment. There is a possible drawback to this type of capital budgeting though. In the budgeting process, management is continually involved in rationing funds to a select number of projects that have been identified by the staff or department heads. If this upward flow of identified projects is simply a "one for one swap" of existing equipment, it could ultimately lead to a perpetualization of the organization as it was seven to ten years ago. This will create a capital equipment infrastructure that may be less than ideal for the current health care environment.

C. RECOMMENDATIONS

The push to reduce costs by implementing a capitated financing system has left commands with little time to change their orientation in the rethinking of how to optimize the health care of an enrolled population vice providing health care on a fee for service basis.

Most of the information necessary for effective strategic planning is external in nature. Upper management

must monitor and assess such things as health care industry growth rates, regulatory environment, financing trends, compensation policy and others.

Recommend that local decision makers be provided education/guidance on what type of capital equipment item characteristics are needed for a capitated finance environment. Additionally, recommend that templates (i.e., forms, documentation, instructions) be provided to local decision makers so they can justify the purchases of the proper capital equipment items.

Knowledge gained through education, and proper capital equipment items obtained through proper justification, will establish an equipment infrastructure that will assist the organization in providing optimal health care services.

APPENDIX. SUBSTANTIVE ANALYTICAL PROCEDURE

It was desired to compare justifications before the Navy switched to a capitated finance system, 01 October 1995, to justifications after the Navy switched to a capitated finance system. 639 justifications were approved in FY 94. Additionally, 310 justifications were approved for the first four months of FY 95.

Each justification was approximately four pages long. It was determined that the manpower involved to reproduce approximately 4,000 pages of data was excessive. A non-statistical sampling technique was used to reduce the sample size to an acceptable level, while still maintaining an accurate representation of the original data. The formula for non-statistical samples for tests of details from the American Institute of Certified Public Accountants audit and accounting guide *Audit Sampling* is shown in Table 3.

This sampling technique is used when a large volume of documents needs to be sampled. Often it is not cost effective to audit the entire set of documents. The "balance of the population" is the number of documents from which the sample is to be taken. The "tolerable error" is the error that the auditor determines is acceptable. The numbers inside the table, or assurance factors, are

Formula for sample size-tests of details Sample size = $\frac{\text{balance of population}}{\text{tolerable error (N)}}$ x assurance factor		
	Assurance Factors	
Desired degree of audit assurance	Little or no error is expected	Some error is expected
Substantial	3	6
Moderate	2.3	4
Little	1.5	3

Table 3. Non-statistical sample table for tests of details (Whittington and Sauter, 1990).

constants. If the procedures for processing the documents are tightly controlled the first column "little or no error expected" is used. If, in the judgement of the auditor, procedures for processing the documents were not tightly controlled, then the second column "some error is expected" is used. The rows in the table are also judgement calls of the auditor. If the auditor desires substantial audit assurance, a constant in the first row will be used. If moderate or little assurance is desired then a constant in the second row or third row respectively, will be used.

For FY 94 the balance of population was 639. The tolerable error was approximately 4%, or 27 errors. Because it was a military record keeping system reviewed by several levels of administration the expected error was little or none. Because the sample population was relatively large the desired degree of assurance was substantial. This resulted in a sample size of "71" (639/27 x 3 = 71) with substantial assurance of little or no expected error.

For the period in FY 95 the balance of the population was 310. The tolerable error was approximately 4%, or 13 errors. Because it was a military record keeping system reviewed by several levels of administration the expected error was little or none. Because the sample size was smaller than that of FY 94 the desired degree of assurance was determined to be moderate. This resulted in a sample size of "35" (310/13 x 1.5 = 35) with moderate assurance of little or no expected error.

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